ACCUWAY

UM Series

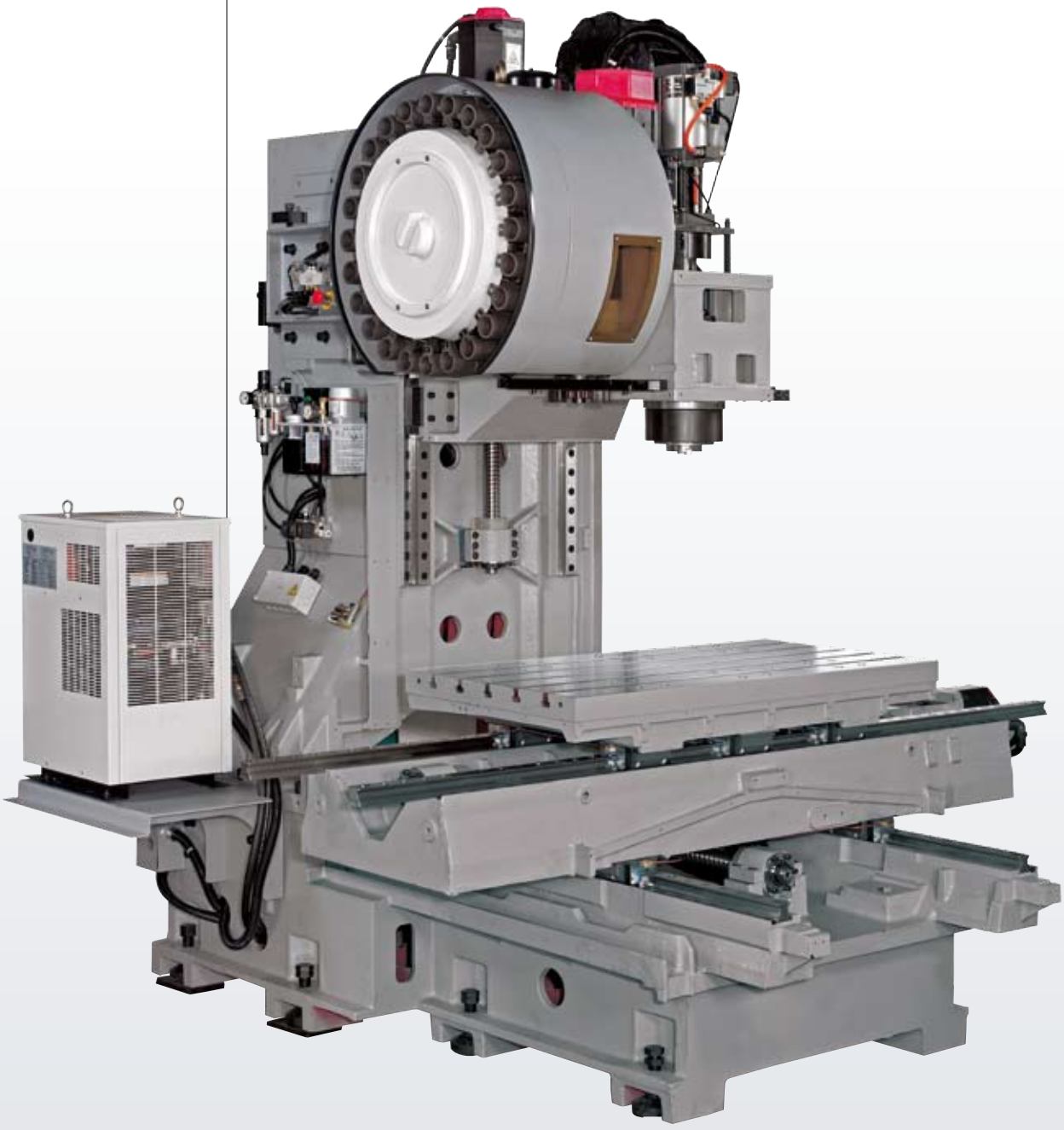
Vertical Machining Center

CE

High-Rigidity Frame Structure Design

- Material cast with Meehanite to upgrade bending resistance and shock absorption, heat-treated so as to eliminate instability within castings. Resists creep and/or metal fatigue under a variety of operating conditions, can maintain mechanical strength and high-speed cutting precision over long periods of time.

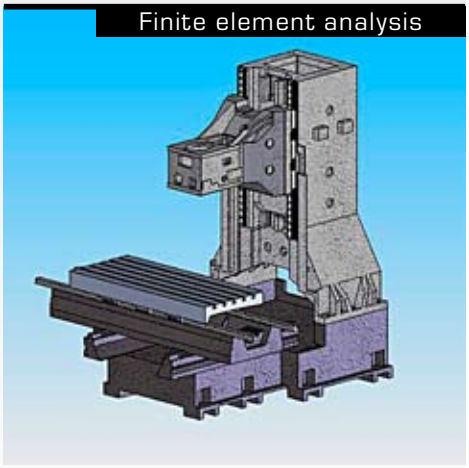
- Casting structure undergoes repeated analysis by elasticity theory principles to attain optimal span and section modulus for symmetrical support design. Bed and saddle box configuration uniformly distributes machine load stress; column with honeycomb ribs resists bending and torsion for maximum span and minimum deflection.



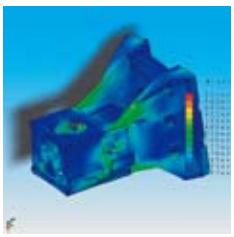
Digitalized Machine Design

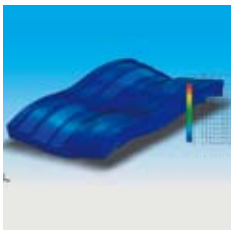
- Advanced finite element analysis (FEA) can simulate various cutting loads; bed structure reinforced ribs distribution is optimized and alleviates weight on the machine.

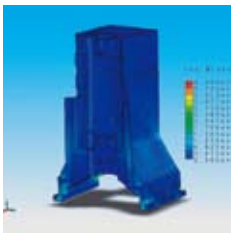
- Three-dimensional model simulates the machine dynamic characteristics for greater understanding of mechanical frame distortion and shock during actual cutting process so as to shorten time from design to manufacture. Also permits maximum freedom of axial motion, widens space for effective processing.

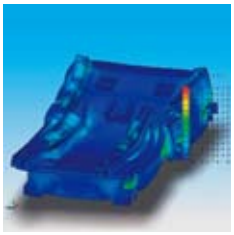


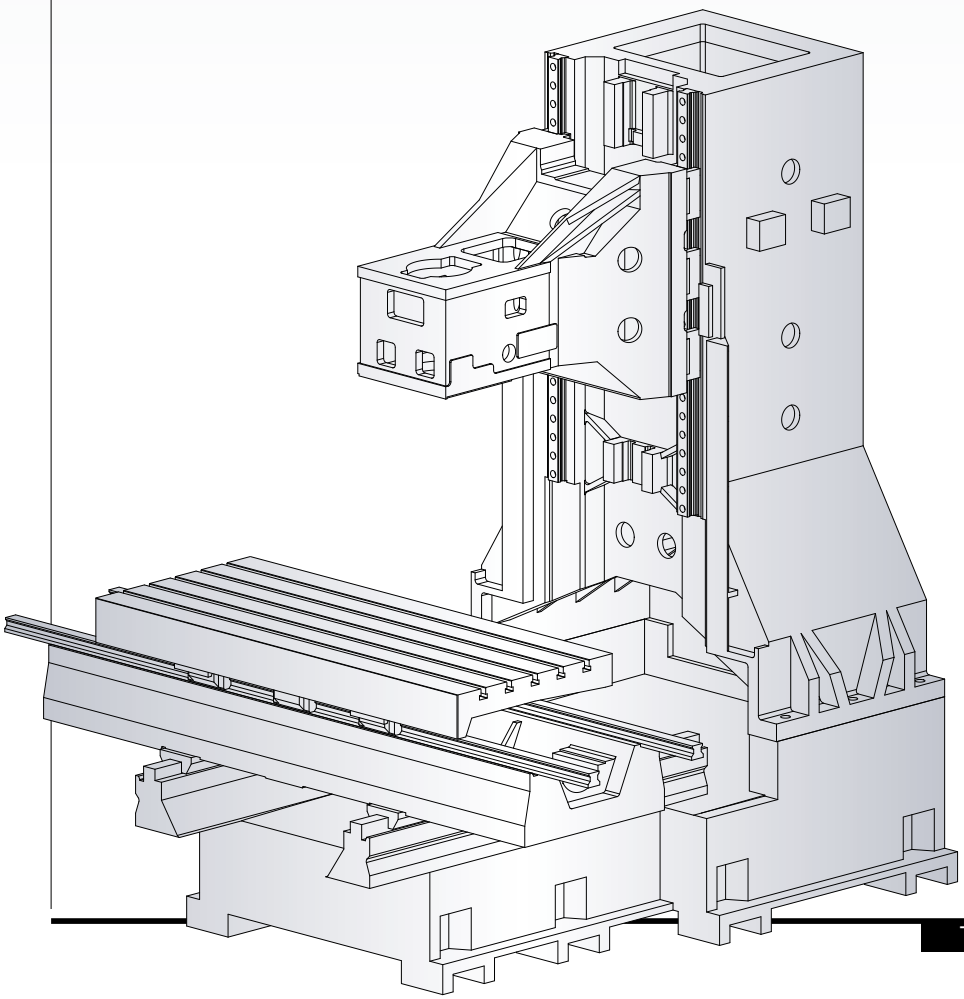
Finite element analysis







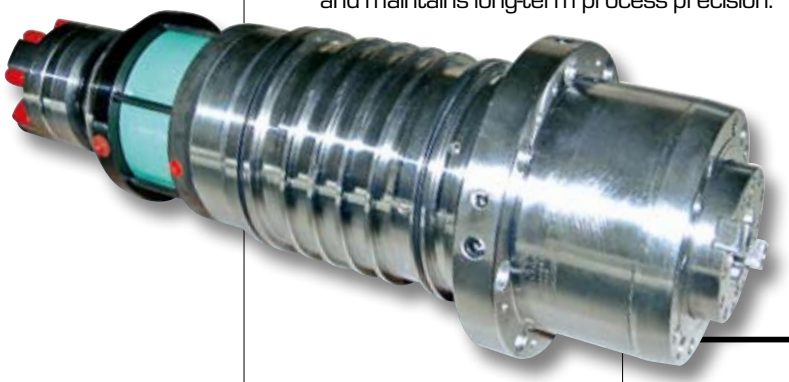




Three-dimensional solid model

Spindle Designed For High Speed and Accuracy

- Spindle uses P4-class precision angular ceramic bearings for strong axial resistance against cutting force. Spindle head is equipped with labyrinthine and air blower to prevent penetration by chips or liquid.
- Cartridge and headstock with box design can withstand heavy cutting force, thus optimizing performance. Floating-type retracted tool design absorbs gravitational force and maintains long-term process precision.



Spindle circulatory cooling system

- Apply coolant ring on spindle nose for synchronized washing, cooling, and lubricating so as to raise productivity, at the same time dissipating spindle heat away from its source to raise cutting precision.

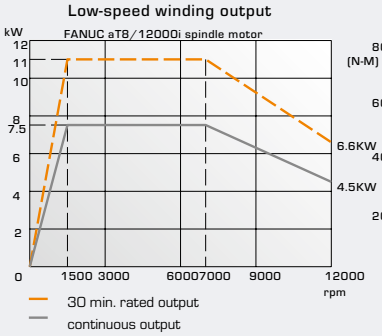
Through-spindle coolant system

- Deep, small-diameter holes for precision cutting can use coolant subjected to 20 bar and passing through the center of the spindle, then directly injected into cutting position to extract fine chips that can damage tools. It can be fitted with a centrifugal filtering system to avoid particles entering the spindle and minimize wear on it.

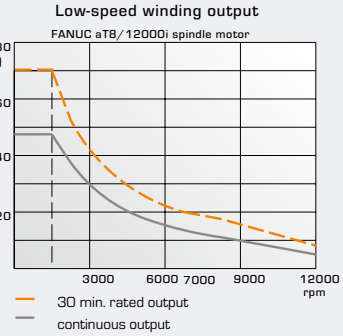
Spindle motor torque power chart

Spindle Speed (12000 rpm)

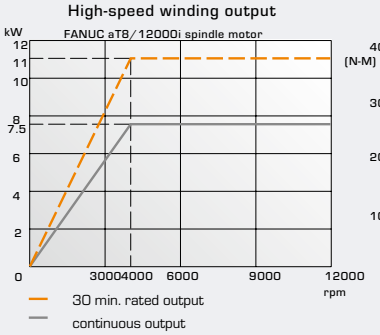
Low-speed winding output



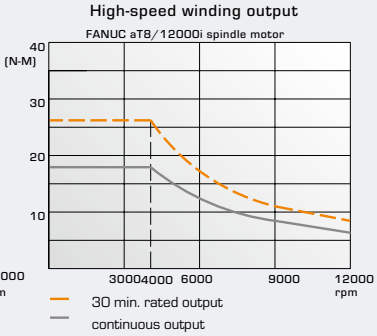
Low-speed winding output



High-speed winding output



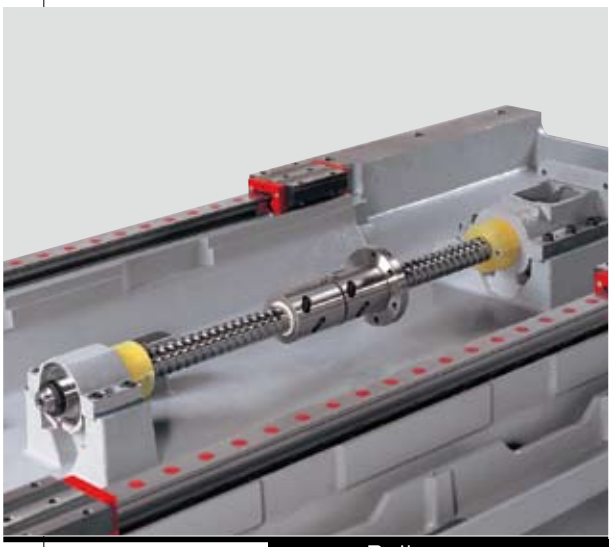
High-speed winding output



High-Accuracy Feeding System

Increase feeding speed > Shorten machining time > Lengthen tool life

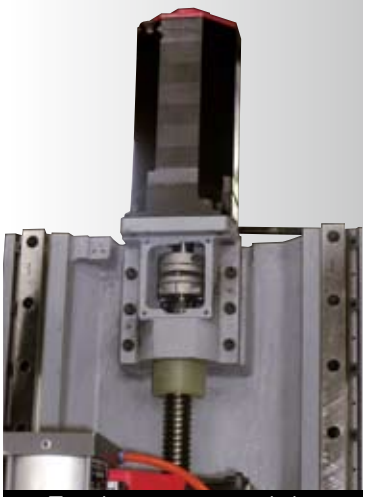
- All three axes can be adapted to linear scale and air sprayer to detect thermal elongation in machine structure and feedback to controller for compensation and enhanced repeat accuracy.



Ball screws

- C3 grade precision ballscrews are preloaded by 1/3 of their maximum axial loading and pre-tension by 3°C temperature rise to reduce backlash, increase stiffness, and counter thermal displacement.
- Servomotor and ballscrews are directly coupled for backlash-free transmission to keep low inertia and high efficiency output, offering excellent dynamic precision during contour machining.

Linear guideways



Z-axis counterweight free transmission

- Heavy-duty linear guideways feature wide rail, larger contact surface, and superior frame rigidity.
- Z-axis servo brake eliminates typical cast iron counterweight and reduces machine weight to ensure machining accuracy within the specified tolerance during rapid feed.

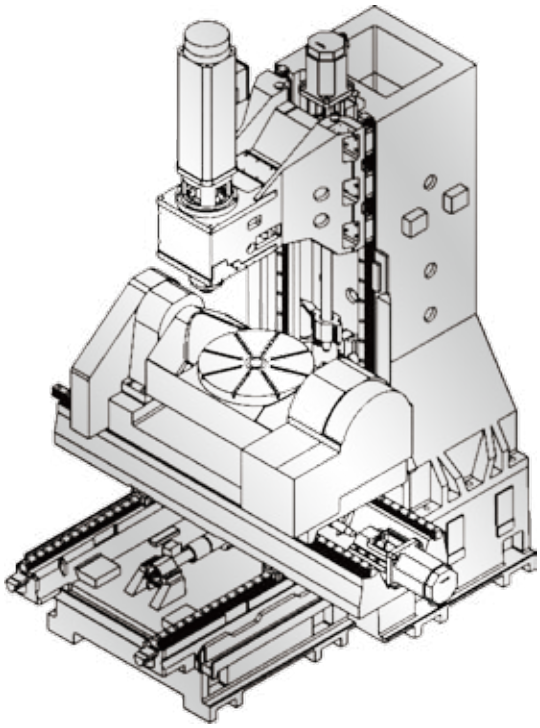
High-Precision Tool Changing System

- Tool magazine has a capacity of 24 tools, fitted with quick and accurate automatic tool changing mechanism. Tool change requires only two to three seconds, which saves cutting time and augments work efficiency.
- PLC program design can manage a tool change for large diameter cutting tool inside the tool magazine.

- Fully enclosed metal cover can check penetration by chips and thereby keep the cutter clean, such that spindle nose precision is unhindered.

4th axis rotary table

- Integrated interface is equipped with 4th and 5th axes for simultaneous complex machining, reducing errors during jig change as well as processing time.



Integrated 5th axis rotary table

Excellent Operating Environment

- Movable control panel with 90˚ swivel angle and detachable manual pulse generator (MPG).


FANUC 18i-MB


Heidenhain iTNC 530

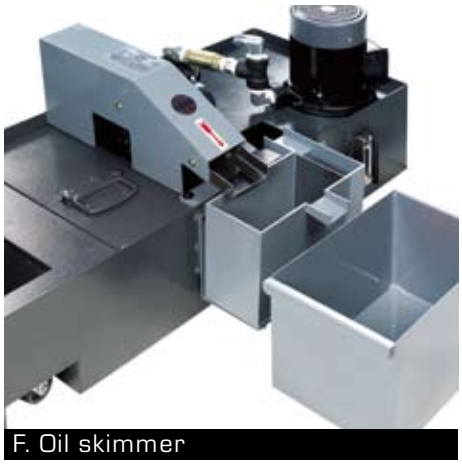
A. Dual-linked front doors design


B. Rear chip discharge system


C. Tool setting system


D. Air filter/Regulator/Lubricator unit

E. Oil mist collector


F. Oil skimmer

A. With optimized door opening offer best access for an operator into the working area.

B. Rear chip discharge system motorized with high-pressure coolant to flush out chips from the bottom. Inverted V-shaped telescoping cover can prevent accumulation of chips.

C. Can be installed on a worktable for checking tool length and diameter, compensate tool data, reduce tool setting and machine idle time.

D. High-quality air filter/regulator/lubricator unit eliminates dust and moisture from compressed air while supplying oil mist to extend service life of pneumatic components and stabilize air pressure for smoother mechanical operation.

E. Suck cutting oil fume inside metal enclosure to provide clean operating enviroment.

F. Separates coolant from dirty particles and lubricant to maintain coolant function and extend service life.

Mold Machining Samples and Quality Inspection

The Best choice for high-precision, high-efficiency mold and die machining

Cellular phone mold

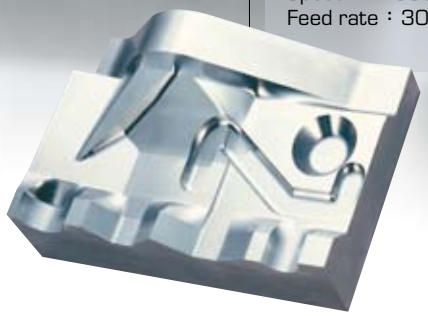
Dimensions：140 × 80 × 25 mm
Material：Starvax
Hardness：HRc 52

Cutting Parameters
Tool：R 0.5 BEM (total 7 tools)
Speed：12000 rpm
Feed rate：840 mm/min

Machining test model

Dimensions：184 × 134 × 60 mm
Material：A7075

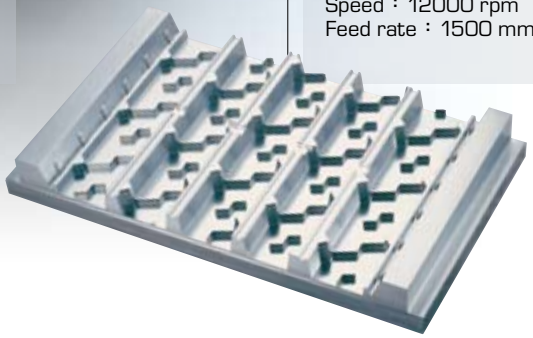
Cutting Parameters
Tool：R 3 BEM (total 2 tools)
Speed：12000 rpm
Feed rate：3000 mm/min



Rubber tire mold

Dimensions：300 × 180 × 50 mm
Material：A7075

Cutting Parameters
Tool：R 0.5 BEM (total10 tools)
Speed：12000 rpm
Feed rate：1500 mm/min



Ball bar circularity testing

- Three-dimensional circularity inspection optimizes servo control parameter.

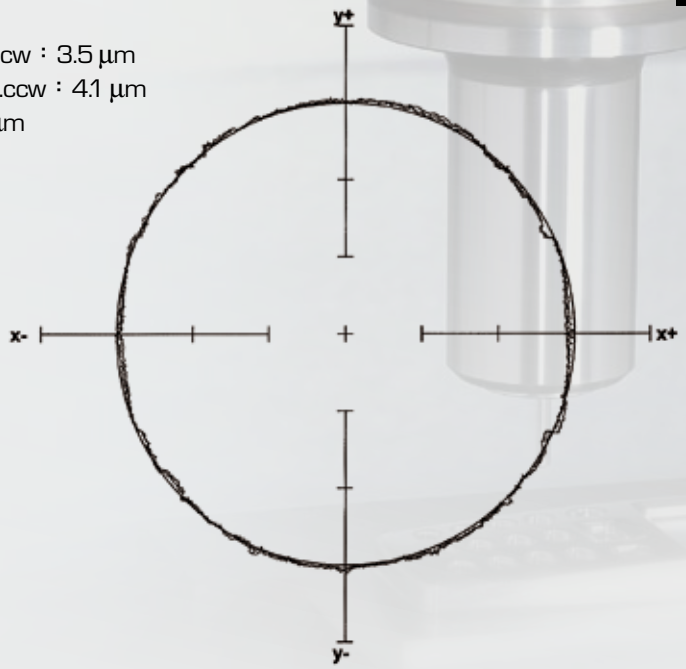
Laser interferometer measurement and calibration

- Applying VDI 3441 measurement procedure, it uses a laser interferometer to calibrate and compensate repeat accuracy.

Ball bar test

Ball bar test

- ISO230-4 results
- Circular Deviation G, 1.cw : 3.5 µm
- Circular Deviation G, 2.ccw : 4.1 µm
- Circularity LSC : 4.5 µm



/CW /CCW Scale 20.0 µm

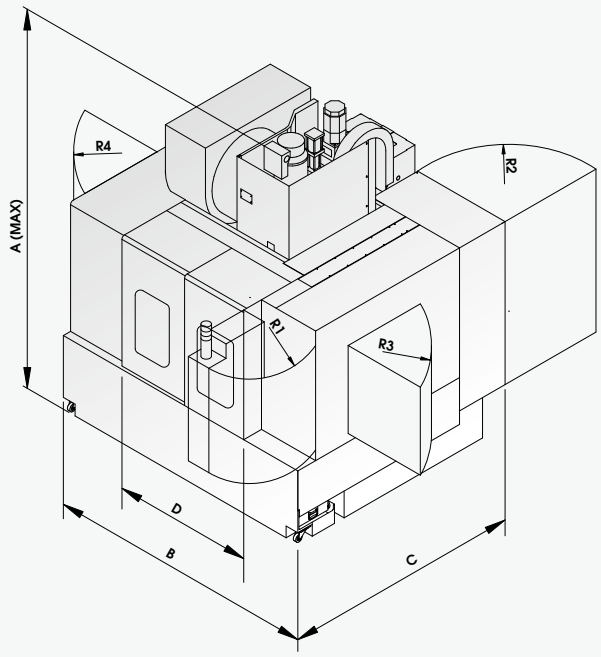
Accuracy Standard

Accuracy Standard

ACCURACY Bi-directional (ISO 10791-4 / ISO 230-2)			ISO	ACCUWAY				ISO	ACCUWAY
Machine Model	UNIT			UM-85H	UM-110H	UM-85	UM-110		UM-130
Positioning Full stroke – without Scales	µm	X	32	8	8	8	8	42	10
		Y	25	8	8	8	8	25	10
		Z	25	8	8	8	8	25	10
Repeatability Full stroke – without Scales	µm	X	18	6	6	6	6	20	7
		Y	15	6	6	6	6	15	7
		Z	15	6	6	6	6	15	7
Circularity (Ø300mm F1000)	µm		N/A	6	6	6	6	N/A	6

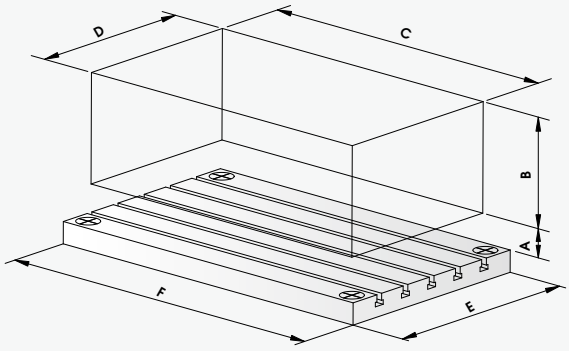
Unit：mm

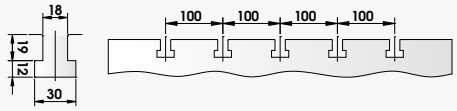
Machine dimensions



UM Sereies					
	60	75	85/85H	110/110H	130
A	2855	2855	2950	2950	2950
B	2000	2300	2660	2950	3300
C	2160	2160	2160	2612	2162
D	830	920	1165	1270	1480
R1	550	550	540	580	700
R2	-	-	886	886	886
R3	850	850	880	880	880
R4	850	850	880	880	880

Axial Travel Strokes

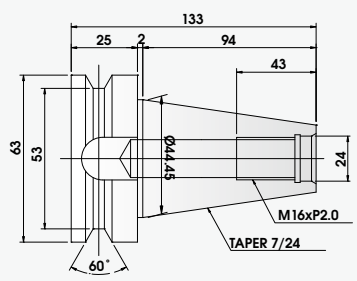


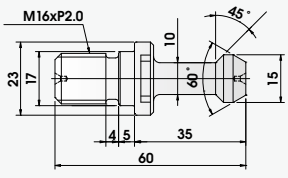


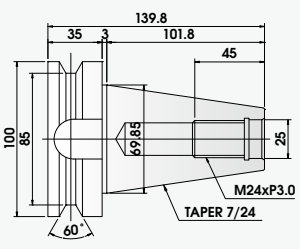
	A	B	C	D	E	F
UM-60	120	510	600	510	560	900
UM-75	120	510	750	510	560	1050
UM-85/85H	150	550	850	550	600	1100
UM-100/110H	150	550	1100	550	600	1200
UM-130	150	550	1300	650	650	1500

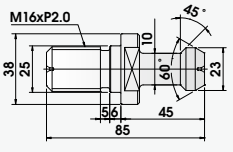
Pull Stud And Tool Shank

- BT - 40
- MAS - P40T - 1
- BT - 50
- MAS - P50T - 1









UM Series

Item / Model	UM-85H	UM-110H	UM-60	UM-75	UM-85	UM-110	UM-130
FANUC Controller							
FANUC 18i-MB	●	●	○	○	–	–	○
FANUC 0i-MC	–	–	●	●	●	●	●
Data server [128 MB]	●	●	○	○	○	○	○
AI NANO	●	●	–	–	–	–	–
AICC	–	–	●	●	●	●	●
HPCC	○	○	○	○	–	–	○
8.4" LCD monitor + manual guide 0i	–	–	●	●	●	●	●
10.4" LCD monitor + manual guide i	●	●	○	○	○	○	○
Detachable MPG	●	●	●	●	●	●	●
RS-232 interface	●	●	●	●	●	●	●
Rigid tapping	●	●	●	●	●	●	●
Heat exchanger for electric cabinet	●	●	●	●	●	●	●
Heidenhain Controller – iTNC 530	○	○	–	–	○	○	○
Spindle							
8000 rpm	–	–	●	●	●	●	●
10000 rpm	○	○	○	○	○	○	○
12000 rpm	●	●	○	○	–	–	–
15000 rpm	○	○	○	○	–	–	–
40 taper spindle	●	●	●	●	●	●	●
50 taper spindle	–	–	–	–	–	○	○
Spindle motor power 15/18.5kW <Con./30 min>	○	○	–	–	○	○	●
Spindle oil cooling system	●	●	○	○	●	●	●
Through-spindle coolant system	○	○	○	○	○	○	○
Machinery Accessories							
Lubrication system	●	●	●	●	●	●	●
Standard coolant pump system	●	●	●	●	●	●	●
Cutter air blast	●	●	●	●	●	●	●
16-position Geneva type tool magazine	–	–	○	○	–	–	–
32-position tool magazine	○	○	–	–	○	○	○
Rear chip wash down system	●	●	●	●	●	●	●
Chip conveyor & chip cart	○	○	○	○	○	○	○
Rear side dual chip conveyor	–	○	○	–	–	○	○
Spray gun	●	●	●	●	●	●	●
Three-color work condition light	●	●	●	●	●	●	●
Linear scale [Heidenhain]	○	○	○	○	○	○	○
Tool setter [Renishaw, Metrol]	○	○	○	○	○	○	○
Interface for 4th and 5th axes rotary table	○	○	○	○	○	○	○
Oil mist collector	○	○	○	○	○	○	○
Oil mist cutting system	○	○	○	○	○	○	○
Oil skimmer	○	○	○	○	○	○	○
Z-axis travel 740 mm	○	○	–	–	○	○	○
ZF gear box [50 taper]	–	–	–	–	–	○	○
4th-axis Rotary Table							
200 mm 4th axis rotary table	○	○	○	○	○	○	–
250 mm 4th axis rotary table	○	○	○	○	○	○	○
320 mm 4th axis rotary table	○	○	–	–	○	○	○

● : Standard ○ : Optional – : Not available

Specification

Item / Model		UM-85H	UM-110H	UM-60	UM-75
Spindle					
Spindle speed	rpm	12000[15000]	12000[15000]	8000[10000]	8000[10000]
Spindle hole taper		BT40			
Bearing inner diameter	mm	70			
Drive system		Direct		Belt[Direct]	
Travels					
X-axis	mm	850	1100	600	750
Y-axis	mm	550	550	510	510
Z-axis	mm	550	550	510	510
Spindle nose to table	mm	150	150	150	150
Table					
Table dimension	mm	1100 x 600	1200 x 600	900 x 560	1050 x 560
T-slot [No. of T-slot x width x pitch]	mm	5 x 18 x 100			
Max. weight on table	kg	1000	1200	500	500
Feed Rate					
Rapid traverse rate [X/Y/Z]	m/min	42 / 42 / 30	42 / 42 / 30	36 / 36 / 30	36 / 36 / 30
Cutting feed rate	m/min	12	12	12	12
Ball screw diameter	mm	45	45	40	40
Automatic Tool Change System					
Capacity	pcs	24			
Max. tool weight	kg	7			
Max. tool diameter	mm	80			
Max. tool diameter Without adjacent tools	mm	150			
Method of tool exchange		Arm type			
Max. tool length	mm	300			
Controller					
Type		FANUC 18i-MB		FANUC 0i-MC	
High speed high precision		AI NANO CC		AICC	
Data server		128MB		-	
Motor					
Spindle motor <Cont. / 30 min>	kW	7.5 / 11	7.5 / 11	5.5 / 7.5 (7.5 / 11)	
X/Y/Z feed motor	kW	3 / 3 / 4			
Coolant pump <50Hz/60Hz>	kW	0.53 + 0.85 / 0.75 + 1.27			
Others					
Air supply	kg/cm^2	5.5			
Machine weight	kg	7000	7500	4500	4700
Machine dimension [LxWxH]	m	2.7 x 2.2 x 3.0	3.0 x 2.2 x 3.0	2.0 x 2.3 x 2.6	2.3 x 2.3 x 2.6

Specification

Item / Model		UM-85	UM-110		UM-130	
Spindle						
Spindle speed	rpm	8000[10000]	8000[10000]	6000	8000[10000]	6000
Spindle hole taper		BT40	BT40	BT50	BT40	BT50
Bearing inner diameter	mm	70	70	90	70	90
Drive system		Belt[Direct]	Belt[Direct]	Belt	Belt	Belt
Travels						
X-axis	mm	850	1100		1300	
Y-axis	mm	550	550		650	
Z-axis	mm	550	550		550	
Spindle nose to table	mm	150	150		150	
Table						
Table dimension	mm	1100 x 600	1200 x 600		1500 x 650	
T-slot [No. of T-slot x width x pitch]	mm	5 x 18 x 100				
Max. weight on table	kg	1000	1200		1200	
Feed Rate						
Rapid traverse rate [X/Y/Z]	m/min	30 / 30 / 30	30 / 30 / 30		30 / 30 / 30	
Cutting feed rate	m/min	12	12		12	
Ball screw diameter	mm	45	45		45	
Automatic Tool Change System						
Capacity	pcs	24	24	24	24	24
Max. tool weight	kg	7	7	15	7	15
Max. tool diameter	mm	80	80	110	80	110
Max. tool diameter Without adjacent tools	mm	150	150	200	150	200
Method of tool exchange		Arm type				
Max. tool length	mm	300	300		300	
Controller						
Type		FANUC 0i-MC				
High speed high precision		AICC				
Motor						
Spindle motor <Cont. / 30 min>	kW	7.5 / 11	7.5 / 11	15 / 18.5	15 / 18.5	15 / 18.5
X/Y/Z feed motor	kW	3 / 3 / 4	3 / 3 / 4	3 / 3 / 7	4 / 4 / 7	
Coolant pump <50Hz/60Hz>	kW	0.53 + 0.85 / 0.75 + 1.27				
Others						
Air supply	kg/cm²	5.5				
Machine weight	kg	7000	7500 / 8000		9000 / 10500	
Machine dimension [LxWxH]	m	2.7 x 2.2 x 3.0	3.0 x 2.2 x 3.0		3.3 x 2.7 x 3.0	

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